



10/789,042

PATENT

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant: Kie Y. Ahn et al.  
Serial No.: 10/789,042  
Filed: February 27, 2004

Examiner: Matthew Landau  
Group Art Unit: 2815  
Docket: 1303.050US2  
Confirmation No.: 8328

Title: LaAlO<sub>3</sub> FILMS

**SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

MS Amendment  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

In compliance with the duty imposed by 37 C.F.R. § 1.56, and in accordance with 37 C.F.R. §§ 1.97 *et. seq.*, the enclosed materials are brought to the attention of the Examiner for consideration in connection with the above-identified patent application. Applicants respectfully request that this Information Disclosure Statement be entered and the documents listed on the attached Form 1449 be considered by the Examiner and made of record. Pursuant to the provisions of MPEP 609, Applicants request that a copy of the 1449 form, initialed as being considered by the Examiner, be returned to the Applicants with the next official communication.

Pursuant to 37 C.F.R. §1.97(c)(2), Applicants hereby authorize the Commissioner to charge the fee of \$180.00 as set forth in 37 C.F.R. §1.17(p), to Deposit Account No. 19-0743. Please charge any additional fees or credit any overpayment to Deposit Account No. 19-0743.

Applicant brings to the attention of the Examiner the following Office Actions and responses associated with one or both of the inventors of the instant application and/or the assignee of the instant application. This material is available and accessible at the United States Patent and Trademark Office.

**EVAPORATED LaAlO<sub>3</sub> FILMS FOR GATE DIELECTRICS**

Application Serial No. 10/081,439 (Atty Ref 1303.046US1) Interview Summary mailed 2-10-05, 1 pg

**LaAlO<sub>3</sub> FILMS FOR ELECTRONIC APPARATUS**

Application Serial No. 11/059,594 (Atty Ref 1303.046US2), Preliminary Amendment filed 02-16-05, 3 pgs  
Application Serial No. 11/059,594 (Atty Ref 1303.046US2), Restriction Requirement mailed 04-06-07, 5 pgs

Application Serial No. 11/059,594 (Atty Ref 1303.046US2), Response filed 05-07-07 to Restriction Requirement mailed 04-06-07, 8 pgs

Application Serial No. 11/059,594 (Atty Ref 1303.046US2), Response filed 2-4-08 to Non-Final Office Action mailed 11-2-07, 14 pgs.

10/15/2008 HBELETE1 00000012 190743 10789042  
01 FC:1806 180.00 DA

Application Serial No. 1/059,594 (Atty Ref 1303.046US2 ) Final Office Action mailed 05/12/2008, 20 pgs  
Application Serial No. 11/059,594 (Atty Ref 1303.046US2) Response filed 8/08/2008 to Final Office  
Action mailed 5/12/2008, 12 pgs

**ATOMIC LAYER-DEPOSITED LaAlO<sub>3</sub> FILMS FOR GATE DIELECTRICS**

Application Serial No. 10/137,499 (Atty Ref 1303.050US1), Restriction Requirement mailed 09-20-02, 6 pgs

Application Serial No. 10/137,499 (Atty Ref 1303.050US1), Response filed 10-21-02 to Restriction Requirement mailed 09-20-02, 2 pgs

Application Serial No. 10/137,499 (Atty Ref 1303.050US1), Non-Final Office Action mailed 11-15-02, 8 pgs

Application Serial No. 10/137,499 (Atty Ref 1303.050US1), Response filed 02-18-03 to Non-Final Office Action mailed 11-15-02, 33 pgs

Application Serial No. 10/137,499 (Atty Ref 1303.050US1), Examiner Interview Summary filed 02-07-06, 2 pgs

Application Serial No. 10/137,499 (Atty Ref 1303.050US1), Comments on Reasons for Notice of Allowance filed 04-06-06, 1 pg

**ATOMIC LAYER-DEPOSITED HAFNIUM ALUMINUM OXIDE FILMS**

Application Serial No. 10/163,481 (Atty Ref 1303.056US1), Restriction Requirement filed 6-16-2004, 4 pgs

Application Serial No. 10/163,481 (Atty Ref 1303.056US1), Response filed 7-7-2004 to Restriction Requirement mailed 06-16-2004, 1 pg

Application Serial No. 10/163,481 (Atty Ref 1303.056US1), Advisory Action mailed 10-13-05, 3 pgs

Application Serial No. 10/163,481 (Atty Ref 1303.056US1), Response filed 04-05-06 to Non Final Office Action mailed 01-05-06, 23 pgs

Application Serial No. 10/163,481 (Atty Ref 1303.056US1), Notice of Allowance filed 6-27-2006, 4 pgs

Application Serial No. 10/163,481 (Atty Ref 1303.056US1), Amendment Under 37 C.F.R. filed 9-15-2006, 3 pgs

Application Serial No. 10/163,481 (Atty Ref 1303.056US1), Notice of Allowance mailed 06-27-06, 6 pgs

Application Serial No. 10/163,481 (Atty Ref 1303.056US1), Response filed 10-11-06 to Rule 312

Communication Received, 3 pgs

**HfAlO<sub>3</sub> FILMS FOR GATE DIELECTRICS**

Application Serial No. 10/930,431 (Atty Ref 1303.056US2), Advisory Action filed 10-17-06, 2 pgs

Application Serial No. 10/930,431 (Atty Ref 1303.056US2), Advisory Action mailed 12-28-07, 2 pgs

Application Serial No. 10/930,431 (Atty Ref 1303.056US2), Response filed 01-14-08 to Advisory Action mailed 12-28-07, 12 pgs

Application Serial No. 10/930,431 (Atty Ref 1303.056US2), Non Final Office Action mailed 04-08-08, 8 pgs

Application Serial No. 10/930,431 (Atty Ref 1303.056US2), Response filed 07-03-08 to Non Final Office Action mailed 04-08-08, 11 pgs

**A METHOD INCLUDING FORMING GATE DIELECTRICS HAVING MULTIPLE LANTHANIDE OXIDE LAYERS**

Application Serial No. 10/163,686, (Atty Ref 1303.059US1) Restriction Requirement mailed 4-5-2004, 5 pgs

Application Serial No. 10/163,686, (Atty Ref 1303.059US1) Response filed 5-5-2004 to Restriction Requirement mailed 4-5-2004, 1 pg

Application Serial No. 10/163,686, (Atty Ref 1303.059US1) Advisory Action mailed 3-18-2005, 2 pgs

Application Serial No. 10/163,686, (Atty Ref 1303.059US1) Advisory Action mailed 2-21-2006, 2 pgs

Application Serial No. 10/163,686, (Atty Ref 1303.059US1) Response filed 3-23-2006 to Advisory Action mailed 2-21-2006, 16 pgs

**Electronic Devices Having Lanthanide Dielectrics**

Application Serial No. 10/931,365 (Atty Ref 1303.059US2), Restriction Requirement mailed 07-05-06, 4 pgs

Application Serial No. 10/931,365 (Atty Ref 1303.059US2), Advisory Action mailed 07-10-07, 2 pgs

Application Serial No. 10/931,365 (Atty Ref 1303.059US2), Notice of Appeal filed 07-30-07, 5 pgs

Application Serial No. 10/931,365 (Atty Ref 1303.059US2), Appeal Brief Under 37 C.F.R 41.37 filed 10-01-07, 22 pgs

Application Serial No. 10/931,365 (Atty Ref 1303.059US2), Examiner's Answer mailed 01-10-08 to

Appeal Brief filed 10-01-07, 40 pgs

Application Serial No. 10/931,365 (Atty Ref 1303.059US2), Response to Examiner's Answer - Request for Oral Hearing filed 03-11-08, 7 pgs

**ATOMIC LAYER DEPOSITED HfSiON DIELECTRIC FILMS WHEREIN EACH PRECURSOR IS INDEPENDENTLY PULSED**

Application Serial No. 10/229,903 (Atty Ref 1303.078US1), Restriction Requirement mailed 07-25-03, 6 pgs

Application Serial No. 10/229,903 (Atty Ref 1303.078US1), Response filed 08-25-03 to Restriction Requirement mailed 07-25-03, 6 pgs

Application Serial No. 10/229,903, (Atty Ref 1303.078US1) Advisory Action mailed 5-24-2006, 2 pgs

Application Serial No. 10/229,903, (Atty Ref 1303.078US1) Response filed 6-8-2006 to Advisory Action, 2 pgs

Application Serial No. 10/229,903, (Atty Ref 1303.078US1) Amendment Under 37 C.F.R. filed 10-31-2006, 3 pgs

Application Serial No. 10/229,903 (Atty Ref 1303.078US1), PTO response to rule 312 comm mailed 01-18-07, 2 pgs

**DEVICES WITH HfSiON DIELECTRIC FILMS WHICH ARE Hf-O RICH**

Application Serial No. 10/930,516 (Atty Ref 1303.078US2), Restriction Requirement mailed 03-28-06, 5 pgs

Application Serial No. 10/930,516 (Atty Ref 1303.078US2), Restriction Requirement mailed 05-09-06, 5 pgs

Application Serial No. 10/930,516 (Atty Ref 1303.078US2), Response filed 06-09-06 to Restriction Requirement mailed 05-09-06, 10 pgs

Application Serial No. 10/930,516 (Atty Ref 1303.078US2), Response filed 11-08-07 to Notice of Allowance mailed 08-10-07, 9 pgs

Application Serial No. 10/930,516 (Atty Ref 1303.078US2), Response filed 04-26-06 to Restriction Requirement mailed 03-28-06, 9 pgs

**ATOMIC LAYER DEPOSITED Zr-Sn-Ti-O FILMS USING TiI<sub>4</sub>**

Application Serial No. 10/309,583 (Atty Ref 1303.082US1), Restriction Requirement mailed 07-28-03, 6 pgs

Application Serial No. 10/309,583 (Atty Ref 1303.082US1), Response filed 08-28-03 to Restriction Requirement mailed 07-28-03, 6 pgs

**Zr-Sn-Ti-O FILMS**

Application Serial No. 10/931,341 (Atty Ref 1303.082US2), Final Office Action mailed 09-12-07, 5 pgs

Application Serial No. 10/931,341 (Atty Ref 1303.082US2), Advisory Action mailed 11-28-07, 2 pgs

Application Serial No. 10/931,341 (Atty Ref 1303.082US2), Notice of Allowance mailed 03-14-08, 5 pgs

**ATOMIC LAYER DEPOSITED Zr-Sn-Ti-O FILMS USING TiI<sub>4</sub>**

Application Serial No. 11/214,693 (Atty Ref 1303.082US3), Non-Final Office Action mailed 10-31-06, 6 pgs

Application Serial No. 11/214,693 (Atty. Ref. 1303.082US3) Notice of Allowance mailed 03-17-08, 13 pgs

**ATOMIC LAYER DEPOSITED DIELECTRIC LAYERS**

Application Serial No. 10/379,470 (Atty Ref 1303.090US1), Examiner Interview Summary filed 06-22-05, 1 pg

Application Serial No. 10/379,470 (Atty Ref 1303.090US1), Final Office Action mailed 04-05-06, 10 pgs

Application Serial No. 10/379,470 (Atty Ref 1303.090US1), Response filed 06-05-06 to Final Office Action mailed 04-05-06, 21 pgs

Application Serial No. 10/379,470 (Atty Ref 1303.090US1), Advisory Action mailed 06-23-06, 3 pgs

Application Serial No. 10/379,470 (Atty Ref 1303.090US1), Response filed 07-05-06 to Advisory Action mailed 06-23-06, 21 pgs

**ELECTRONIC APPARATUS WITH DEPOSITED DIELECTRIC LAYERS**

Application Serial No. 11/213,013 (Atty Ref 1303.090US2), Restriction Requirement mailed 06-19-06, 5 pgs

Application Serial No. 11/213,013 (Atty Ref 1303.090US2), Response filed 07-19-06 to Restriction Requirement mailed 06-19-06, 11 pgs

Application Serial No. 11/213,013 (Atty Ref 1303.090US2), Advisory Action mailed 04-18-07, 3 pgs

Application Serial No. 11/213,013 (Atty Ref 1303.090US2), Notice of Allowance mailed 08-06-07, 7 pgs

Application Serial No. 11/213,013 (Atty Ref 1303.090US2), Notice of Allowance mailed 03-21-08, 7 pgs

**ZIRCONIUM-DOPED TANTALUM OXIDE FILMS**

Application Serial No. 10/909,959 (Atty Ref 1303.114US1), Restriction Requirement mailed 06-29-06, 4 pgs

Application Serial No. 10/909,959 (Atty Ref 1303.114US1), Response filed 07-26-06 to Restriction Requirement mailed 06-29-06, 12 pgs

Application Serial No. 10/909,959 (Atty Ref 1303.114US1), Restriction Requirement mailed 10-16-06, 4 pgs

Application Serial No. 10/909,959 (Atty Ref 1303.114US1), Response filed 11-16-06 to Restriction Requirement mailed 10-16-06, 7 pgs

Application Serial No. 10/909,959 (Atty Ref 1303.114US1), Response filed 11-08-07 to Final Office Action mailed 08-08-07, 13 pgs

Application Serial No. 10/909,959 (Atty Ref 1303.114US1), Non Final Office Action mailed 01-09-08, 13 pgs

Application Serial No. 10/909,959 (Atty Ref 1303.114US1), Response filed 04-09-08 to Non Final Office Action mailed 01-09-08, 12 pgs

**ZIRCONIUM-DOPED TANTALUM OXIDE FILMS**

Application Serial No. 11/608,281 (Atty Ref 1303.114US3), Preliminary Amendment filed 12-12-07, 7 pgs

**METHOD OF FORMING APPARATUS HAVING OXIDE FILMS FORMED USING ATOMIC LAYER DEPOSITION**

Application Serial No. 10/931,533 (Atty Ref 1303.119US1), Restriction Requirement mailed 10-10-06, 4 pgs

Application Serial No. 10/931,533 (Atty Ref 1303.119US1), Response filed 11-09-06 to Restriction Requirement mailed 10-10-06, 11 pgs

Application Serial No. 10/931,533 (Atty Ref 1303.119US1), Advisory Action mailed 12-31-07, 2 pgs

Application Serial No. 10/931,533 (Atty Ref 1303.119US1), Response filed 01-10-08 to Advisory Action mailed 12-31-07, 19 pgs

Application Serial No. 10/931,533 (Atty Ref 1303.119US1), Non Final Office Action mailed 03-31-08, 11 pgs

Application Serial No. 10/931,533 (Atty Ref 1303.119US1), Response filed 06-30-08, 20 pgs

Application Serial No. 10/931,533 (Atty Ref 1303.119US1), Response filed 06-30-08 to Non Final Office Action mailed 03-31-08, 20 pgs

Application Serial No. 10/931,533 (Atty Ref 1303.119US1), Response filed 06-30-08 to Non Final Office Action mailed 03-31-08, 20 pgs

**TITANIUM ALUMINUM OXIDE FILMS**

Application Serial No. 11/566,042 (Atty Ref 1303.119US2), Preliminary Amendment filed 12-12-07, 6 pgs

**LANTHANIDE OXIDE DIELECTRIC LAYER**

Application Serial No. 10/926,812 (Atty Ref 1303.121US1), Restriction Requirement mailed 04-05-05, 4 pgs

Application Serial No. 10/926,812 (Atty Ref 1303.121US1), Response filed 04-26-05 to Restriction Requirement mailed 04-05-05, 1 pg

Application Serial No. 10/926,812 (Atty Ref 1303.121US1), Preliminary Amendment filed 08-03-05, 13 pgs

Application Serial No. 10/926,812 (Atty Ref 1303.121US1), Amendment Under 37 C.F.R. filed 05-04-06, 2 pgs

**METHODS FOR FORMING A LANTHANUM-METAL OXIDE DIELECTRIC LAYER**

Application Serial No 10/930,167 (Atty Ref 1303.122US1), Preliminary Amendment mailed 11-15-05, 13 pgs.

Application Serial No 10/930,167 (Atty Ref 1303.122US1), Restriction Requirement mailed 10-4-06, 4 pgs.

Application Serial No 10/930,167 (Atty Ref 1303.122US1), Response filed 11-6-06 to Restriction Requirement mailed 10-4-06, 10 pgs.

Application Serial No. 10/930,167 (Atty Ref 1303.122US1), Response filed 1-5-08 to Non Final Office Action mailed 9-4-07, 12 pgs.

Application Serial No 10/930,167 (Atty Ref 1303.122US1), Non Final Office Action mailed 3-14-08, 6 pgs.

Application Serial No. 10/930,167 (Atty Ref 1303.122US1), Non-Final Office Action mailed 03-14-08, 6 pgs

Application Serial No 10/930,167 (Atty Ref 1303.122US1), Response filed 6-16-08 to Non Final Office Action mailed 6-16-08, 12 pgs.

Application Serial No. 10/930,167 (Atty Ref 1303.122US1), Response filed 6-16-08 to Non Final Office Action mailed 3-14-2008,

Application Serial No. 10/930167 (Atty Ref 1303.122US1) Response filed 6-16-08 to Non Final Office Action mailed 3-14-08, 12 pgs

**LANTHANUM ALUMINUM OXIDE DIELECTRIC LAYER**

Application Serial No. 11/608,286 (Atty Ref 1303.122US2), Preliminary Amendment mailed 12-12-07, 7 pgs.

**ATOMIC LAYER DEPOSITION AND CONVERSION**

Application Serial No. 10/137,058 (Atty Ref 303.802US1), Restriction Requirement mailed 01-13-2004, 6 pgs

Application Serial No. 10/137,058 (Atty Ref 303.802US1), Response filed 02-13-2004 to Restriction Requirement mailed 01-13-2004, 1 pg

Application Serial No. 10/137,058 (Atty Ref 303.802US1), Restriction Requirement mailed 05-28-2004, 5 pgs

Application Serial No. 10/137,058 (Atty Ref 303.802US1), Response filed 06-28-2004 to Restriction Requirement mailed 05-28-2004, 1 pg

Application Serial No. 10/137,058 (Atty Ref 303.802US1), Restriction Requirement mailed 09-24-2004, 5 pgs

Application Serial No. 10/137,058 (Atty Ref 303.802US1), Response filed 10-22-2004 to Restriction Requirement mailed 09-24-2004, 1 pg

Application Serial No. 10/137,058 (Atty Ref 303.802US1), Restriction Requirement mailed 01-11-2005, 5 pgs

Application Serial No. 10/137,058 (Atty Ref 303.802US1), Response filed 02-10-2005 to Restriction Requirement mailed 01-11-2005, 1 pg

Application Serial No. 10/137,058 (Atty Ref 303.802US1), Restriction Requirement mailed 05-19-2005, 5 pgs

Application Serial No. 10/137,058 (Atty Ref 303.802US1), Response filed 06-20-2005 to Restriction Requirement mailed 05-19-2005, 1 pg

Application Serial No. 10/137,058 (Atty Ref 303.802US1), Restriction Requirement mailed 09-28-2005, 5 pgs

Application Serial No. 10/137,058 (Atty Ref 303.802US1), Response filed 10-25-2005 to Restriction Requirement mailed 09-28-2005, 1 pg

Application Serial No. 10/137,058 (Atty Ref 303.802US1), Restriction Requirement mailed 01-05-2006, 6 pgs

Application Serial No. 10/137,058 (Atty Ref 303.802US1), Response filed 01-22-2006 to Restriction Requirement mailed 09-28-2005, 1 pg

Application Serial No. 10/137,058 (Atty Ref 303.802US1), Restriction Requirement mailed 08-02-2006, 6 pgs

Application Serial No. 10/137,058 (Atty Ref 303.802US1), Response filed 08-31-2006 to Restriction Requirement mailed 08-02-2006, 22 pgs

Application Serial No. 10/137,058 (Atty Ref 303.802US1), Non Final Office Action mailed 12-12-2007, 9 pgs

Application Serial No. 10/137,058 (Atty Ref 303.802US1), Response filed 03-16-2008 to Non Final Office Action mailed 12-12-2007, 28 pgs

Application Serial No. 10/137,058 (Atty Ref 303.802US1), Final Office Action mailed 07-11-08, 21 pgs

Application Serial No. 10/137,058 (Atty Ref 303.802US1), Final Office Action mailed 07-11-2008, 12 pgs

Application Serial No. 10/137,058 (Atty Ref 303.802US1), Response filed 09-11-2008 to Final Office Action mailed 09-11-2008, 30 pgs

#### **ATOMIC LAYER DEPOSITION AND CONVERSION**

Application Serial No. 10/929,272 (Atty Ref 303.802US2), Restriction Requirement mailed 07-14-05, 6 pgs

Application Serial No. 10/929,272 (Atty Ref 303.802US2), Response filed 08-11-05 to Restriction Requirement mailed 07-14-05, 7 pgs

Application Serial No. 10/929,272 (Atty Ref 303.802US2), Response filed 01-09-06 to Non Final Office Action mailed 09-09-05, 8 pgs

Application Serial No. 10/929,272 (Atty Ref 303.802US2), Notice of Allowance mailed 02-05-08, 20 pgs

Application Serial No. 10/929,272 (Atty Ref 303.802US2), Notice of Allowance mailed 06-05-08, 7 pgs

Application Serial No. 10/929,272 (Atty Ref 303.802US2), Notice of Allowance mailed 09-24-08, 21 pgs

Pursuant to 37 C.F.R. 1.98(a)(2), Applicant believes that copies of cited U.S. Patents and Published Applications, and Non-Published Applications identifiable by USPTO Serial Number, are no longer required to be provided to the Office. Notification of this change to this effect was provided in the United States Patent and Trademark Office OG Notice dated October 19, 2004. Thus, Applicant has not included copies of any US Patents or US Patent Applications identifiable by serial number that may be cited with this submission. Should the Office require copies to be provided, Applicant respectfully requests that notice of such requirement be directed to Applicant's below-signed representative. Applicant acknowledges the requirement to submit copies of foreign patent documents and non-patent literature in accordance with 37 C.F.R. 1.98(a)(2).

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Serial Number: 10/789,042

Filing Date: February 27, 2004

Title: LaAIO3 FILMS

Page 7

Dkt: 1303.050US2

The Examiner is invited to contact the Applicants' Representative at the below-listed telephone number if there are any questions regarding this communication.


Respectfully submitted,

SCHWEGMAN, LUNDBERG & WOESSNER, P.A.

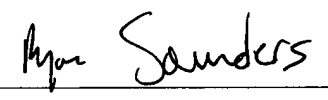
P.O. Box 2938

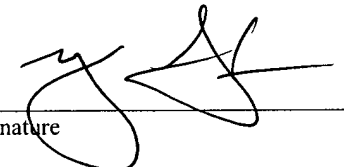
Minneapolis, MN 55402

(612) 371-2157

Date 9 October 2008 By   
David R. Cochran  
Reg. No. 46,632

CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: MS Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this 9th day of October, 2008.

  
Name

  
Signature